OUR BOOK SHELF

The Spectroscope and its Work. By Richard A. Proctor. Society for Promoting Christian Knowledge. (London : 1877.)

IN a little work of 127 pp. Mr. Proctor has clearly and logically explained the principles of the science of spectroscopy, and has given a sketch of the main results of spectroscopic research into the nature of the sun, stars, and nebulæ.

One of the features of this book is, we think, the logical manner in which the principles of spectroscopic analysis are developed from the facts gained by observation and experiment ; the steps of the various reasonings are succinctly but clearly stated ; this is a point of much importance. In too many so-called scientific text-books there is a loose and illogical method of connecting facts, and conclusions drawn from these facts ; by the perusal of such books the general reader is either strengthened in his prejudged conviction that science teaching is of little or no value as a mental exercise, or he is taught, often almost unconsciously, to believe that the generalisations of science and the facts of science rest upon exactly the same evidence. Another feature in Mr. Proctor's little book is the adoption, necessarily to but a limited extent, of the method of historically developing the facts of the science of which he treats. The leading steps in the history of the most important advances in spectroscopy are traced, frequently by quotation from the classical memoirs of the great workers in the science.

The book is divided into eight chapters, headed respectively "Analysis of Light," "Dark Spaces in the Spectrum," "Various Order of Spectra," "Interpretation of Solar Spectrum," "Solar Prominences, &c.," "Spectra of Stars, &c.," "Atmospheric Lines in Solar Spectrum," "Measuring Motions of Recession and Approach."

Whether as an introduction to the fuller study of spectroscopic analysis, or as a work from which the general reader may gain a clear, and, so far as it goes, complete view of the science, Mr. Proctor's work is deserving of the warmest recommendation.

M. M. PATTISON MUIR

The Great Thirst Land ; a Ride through Natal, Orange Free State, Transvaal, and Kalahari Desert. By Parker Gillmore. (London : Cassell, Petter, and Galpin.)

CAPTAIN GILLMORE'S work is disappointing. The title suggests Major Butler's "Great Lone Land," but the result of a comparison of the two works would not be very favourable to Capt. Gillmore's. He has nothing new to tell the geographer, and many of the hunting stories are comparatively tame. The work is unnecessarily large, and could with advantage be compressed to half its present size. Still there are a number of observations on the Boers and the natives which will interest many, and there are a few good lion stories. The book is handsomely got up.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*

[*The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.*]

Strychnia and its Antidote

THE following circumstance I think worth noticing. Wanting to banish some mice from a pantry, I placed on the floor at night a slice of bread spread over with butter in which I had mixed a threepenny packet of "Battle's vermin killer," which contains about a grain of strychnia along with flour and prussian blue. The following morning I was roused by a servant telling me that a favourite skye terrier was lying dead. I found that the mice had dragged the slice of bread underneath the locked door and that the dog had thus got at it and eaten part equal to about one-sixth of a grain of strychnia ; it lay on its side perfectly rigid ; an occasional tetanic spasm showed that life was not quite extinct. Having notes of the experiments made by direction of the British Medical Association last year, on the antagonism of medicines, and wherein it was conclusively proved that a fatal dose of strychnia could be neutralised by a fatal dose of chloral hydrate, and that the minimum fatal dose of the latter for a rabbit was twenty-one grains, I at once injected under the dog's skin forty-five grains of the chloral in solution, my dog being about twice the weight of a rabbit. In a quarter of an hour fancying the dog was dead, as the spasms had ceased and it lay apparently lifeless, I moved it with my foot, when it at once struggled to its feet and shortly after staggered to its usual corner by the parlour fire ; it took some milk, and except for being quieter than usual seemed nothing the worse for the ordeal it had passed through.

That the fatal effects of a poisonous dose of strychnia was thus counteracted so successfully by what I should say was a poisonous dose of chloral, given hypodermically, is an interesting fact verifying the experiments I alluded to. Without such experiments on the lower animals, a medical man might often be found standing by helpless to aid his fellow-man under similar effects of poison.

Sudbury, Suffolk, February 27 J. SINCLAIR HOLDEN

Age of the Sun in Relation to Evolution

I THINK I may be permitted to point out that Dr. Croll has missed what I had intended to be the main feature of my criticism of his article on the "Age of the Sun in Relation to Evolution." I should therefore wish to reiterate that, in his theory, he takes no account of the proper motions of the stars in space. If it be true that suns or stars have been formed by the collision of bodies possessed of great energy, proper motion can be none other than the unused and unconverted energy of the original components. Supposing the forces, before impact, to be equal and opposite in direction, there can be no misunderstanding that the result will be the *entire* convertion of the "motion of translation to molecular motion," *i.e.*, heat ; but this, according to the law of chances, must be of exceedingly rare occurrence. Yet, from our knowledge of the motions of the stars in space, this, or something very like this, has invariably occurred. Surely here is a *reductio ad absurdum.* In conclusion I will merely state that I have never yet claimed to have suggested a theory reconciling the age of the sun with prevailing opinions in geological science or with the hypothesis of evolution. Having felt the difficulty, I have endeavoured in some measure to stretch the interval wherein these may have had time to effect their changes, but I have not claimed to have succeeded to the desired extent. I am not, therefore, interested in replying to the former part of Dr. Croll's letter, and indeed, with certain minor reservations, have no hesitation in subscribing to it.

JOHN J. PLUMMER

Orwell Dene, Nacton, February 28

The Zoological Station at Naples

PERMIT me to correct some statements made in NATURE, vol. xvii. p. 329. The small steam launch was given to the Zoological Station by the Berlin Academy of Science, in exchange for a working table in the laboratory, which is to be placed at the disposal of the Academy for ten years. The Prussian government subscribed 300*l.* towards the expenses of the launch, which was built by Messrs. J. Thornycroft, Church Wharf, Chiswick, and has proved an excellent little craft.

As to the publications of the Zoological station, the *Prodromus Faunæ Mediterraneæ* will be a compendium of all the species hitherto observed in the Mediterranean, and recorded in scientific works. Its publication is mainly intended to facilitate the nomenclature of the chief work, the "Fauna and Flora of the Gulf of Naples and the Neighbouring Seas," which is to appear in monographs. The *Prodromus* has been undertaken by Prof. T. Victor Carus, whose great knowledge both of zoological literature and classification will answer its exactitude and completeness. The first monograph to be published is not on the *Ctenophoræ*.

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but on the *Ctenophoræ*, a family well known to all students of pelagic animals. ANTON DOHRN

Naples, February 28

Faraday's "Experimental Researches"

IF your readers will compare Mr. Quaritch's letter in last week's NATURE with his advertisement of the two preceding weeks, they will see that it bears its condemnation on its own face. No words of mine can make it plainer than his do, that a *reprint* of an obsolete and valuable book was offered to the public as something not stated to be a reprint. Had that advertisement stated that the work was a "facsimile reprint," there could have been no ground either for complaint or for an indignation for which no apology is needed.

University College, Bristol SILVANUS P. THOMPSON

Mimicry in Birds

ON the evening of the 24th inst. my attention was attracted by an interesting example of mimicry in the case of the starling. The first thing which attracted my attention was hearing the cry of a blackbird in distress, and on looking round, the only bird to be seen was a solitary starling, which, when I first observed it, was uttering its own note; but almost immediately thereafter it began to whistle loudly in imitation of the blackbird. After this, for the space of about half an hour, it kept up a constant succession of notes in mimicry of the chaffinch and sparrow, always, however, using its own note for the space of about half a minute between each change. I may add that it did not seem to have any particular order in which it repeated the various notes.

A gentleman in this neighbourhood tells me that last year he observed a similar occurrence in his garden; but this, so far as I can learn, is the only other instance of similar mimicry in this quarter. Perhaps some of your readers may be able to inform me if it it is of common occurrence elsewhere.

Edinburgh, February 26 J. STUART THOMSON

Great Waterfalls

SEEING Mr. Guillemard's inquiry (vol. xvii. p. 221), I refer him for accounts of the Falls of Tequendama, which I visited in 1851, to "Viajes Cientificos a los Andes Ecuatoriales, &c.," por M. Boussingault, traducidas por J. Acosta; Paris, 1849, and "New Granada: Twenty Months in the Andes," by Prof. Isaac F. Hotton. (New York: Harper and Brothers, 1857.)

New York, February THOS. BLAND

SEVERAL NEW APPLICATIONS OF SCIENCE INTRODUCED INTO WAR

ON Saturday last, the Speaker of the House of Commons and a large following of members, visited the Portsmouth Dockyards, mainly for the purpose of witnessing some torpedo warfare; the *Inflexible* was also inspected. Near the starboard side of the ship, one of the sheds had been converted into a temporary lecture-room, and provided with numerous diagrams, a model of the ship, and a full-sized skeleton model of the 80-ton gun, 26 feet long, 6 feet broad at the breach, and having a calibre of 16 inches, with four of which it is intended to arm the turrets of the *Inflexible*. The diagrams were drawn on a scale of one-fourth of an inch, half an inch, and 6 inches (half-size) to the foot, and were designed with the object of enabling the visitors to draw a comparison between the structures of the *Dreadnought* and the *Inflexible*, and the respective thicknesses and disposition of their armour. As soon as the party had assembled around the drawings, Mr. W. B. Robinson, the Chief Constructor of the yard, stepped forward and delivered a brief illustrative lecture on the main points and differences of the two ships. He pointed out that while the length of the *Inflexible*—320 feet—was exactly the same as the *Dreadnought*, its beam—75 feet—was 11 feet 2 inches broader; that its volume of displacement was greater, its armour heavier, its turrets thicker, and its armament more formidable. While, however, the *Dreadnought* was armoured along the water-line, the citadel of the other ship, which was placed upon an armoured deck below, was the only protected portion of the *Inflexible* above the water. The arrangements of the turrets was also different; for whereas those of the smaller ship were placed along the middle line, the turrets of the larger were *écheloned* to starboard and port in order that all the four guns might be trained upon an enemy either direct ahead or direct astern. The weather deck between the turrets had also been raised, so that the guns could be loaded from below without the necessity of depressing their muzzles. She was supplied with steam and hand pumps, and with Friedland's injectors, which would enable her to discharge 5,300 tons of water an hour. She had 133 water-tight compartments, and water would be admitted into the double bottom to reduce the rolling of the ship. Her torpedoes would be discharged from submerged ports in the bows instead of from above the water in the side, as in the *Thunderer*. The ventilating arrangements will be of the most perfect kind; for, as Mr. Robinson remarked, while in the other ships the fresh air is pumped into all parts, no means are adopted for assisting the vitiated atmosphere out of the ship. In the *Inflexible*, however, the ventilation comprises both supply and exhaust arrangements. The air is brought down into an air chamber, or cave of Æolus, in the central part of the citadel, and is driven thence by steam fans through large pipes, which pass under the armour deck and up into the structures above, and by means of branch pipes fitted with cocks every compartment in the ship can receive an abundant supply. By these cocks an officer can regulate his air supply in much the same way that a householder on shore can regulate his water supply. The vitiated air is sucked up through pipes with perforated ends into the funnels, and thence through the citadel into the open air. The *Inflexible* will be brig-rigged, but her masts will be unshipped before going into action. Her engines are of 8,000-horse power, and she is expected to attain a speed of 14 knots.

Runs of the 16-inch Whitehead torpedo were next made. One was fired from a steam pinnace as in actual warfare, its course, which was in a straight line for about 200 yards, being distinctly traceable by the exhaust air-bubbles which it threw up. The other was discharged from the surface of the water for the purpose of showing how readily it sank automatically to the required depth. The next novelty submitted was the steam pinnace, which, without having a single man on board, can do everything but stoke and keep its own fires alight. Its engines are worked and its movements are controlled wholly by electricity, the cable which supplies it with its mysterious power being unwound from winches as the pinnace sails on its mission, "And drags at each remove a lengthening chain." Its principal use is to drop and explode countermines in the neighbourhood of an enemy's mines, and by destroying them clear a harbour for the approach of the fleet. It performed its work to the amazement of the beholders on Saturday. The countermines were represented by a couple of barrels containing small charges of gun-cotton, and with these slung over the sides it took its departure from the boat containing the battery and dropped the casks at a distance of about 200 yards, igniting at the same time the fuses which blew the barrels into match-wood, and returned obediently, like a "thing of life," to the controlling hand after having accomplished its duty. Near at hand in the basin the torpedo nettings for protecting ships against the locomotive torpedo were exhibited on the sides of the *Actæon*, while the prow of the *Bloodhound*, gunboat, was armed with the trawl with which it is proposed to pick up sunken mines. The notes of the bugle were next heard as a summons to quarters and for the *Thunderer* to be cleared for action. In an

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